

SOIL MANAGEMENT CAN HELP CONTROL JOHNE'S DISEASE



Farmers from Stirlingshire gathered at the QMS Forth monitor farm to learn about how managing the environment can help reduce the risk of Johne's on their farms.

Duncan McEwen and his son, also Duncan, run breeding cattle and sheep enterprises at Arnprior Farm, an 815 acre (330 ha) mixed unit, 12 miles to the west of Stirling. They have been monitor farmers for over two years, and, like the other farmers who attended the meeting, were keen to hear the latest guidance on how to minimise the risk of Johne's disease for the livestock on their farm.

Johne's, an incurable gastrointestinal livestock disease, was first described by Dr Heinrich Albert Johne in 1895. The main signs in cattle are progressive weight loss and chronic diarrhoea, and in some cases death. There is no treatment, and diagnosis and control are difficult.

Johne's doesn't just affect cattle; it can also affect sheep, rabbits and deer, and there is research to indicate that these other species can pass the infection on to cattle.

"The lime spreading to lift the pH was intended to boost general farm productivity. It's good to know that this also helped to reduce the risk of Johne's."



There is no doubt that Johne's has been a challenge to scientists world-wide as they try to establish effective control methods for Mycobacterium avium subspecies paratuberculosis (MAP), the bacterium that causes Johne's.

The major way Johne's spreads in a cattle herd is via faecal material (dung), with calves under a month old being the most vulnerable. However, the disease can also spread from dam to calf.

At the meeting, Dr Rupert Hough from The James Hutton Institute highlighted some of the findings of the Scottish Paraban project – a joint venture to increase understanding of how the Johne's agent behaves.

"Many livestock farmers have health schemes and/or best practice management in place to attempt to control the spread of Johne's.

Duncan McEwen junior



For more information about Johne's disease visit:
www.qmscotland.co.uk/johnes-disease

Johne's Ready Reckoner

Area	High Risk	Medium Risk	Low Risk
Soil pH	Below 6.0	6.0 - 6.5	Above 6.5
Manure Management	Manure spread on grazing land	Manure spread on bedding	Manure spread on silage
Slurry Management	Slurry spread on grazing land	Slurry spread on bedding	Slurry spread on silage
Water	Water from manure pits	Water from silage pits	Water from other sources
Other	Other factors	Other factors	Other factors

"While some of these measures are successful, they do not seem to work on all farms, suggesting that there are other factors associated with disease prevalence," he said.

"While the biggest risk to cattle is thought to be other infected cattle, the potential for MAP to survive for lengthy periods in the environment is one of the reasons why it is so difficult to control. There is evidence to suggest that soil characteristics play a role in its survival."

As part of the Paraban project, MAP bacteria levels were assessed in numerous soil samples taken from eight Scottish mainland farms, a mix of beef and dairy, ranging geographically from the far north-east to the south-west.

"We established that pH and levels of available iron seem significant to the length of survival of MAP in the soil. As soil pH levels decrease, the availability of iron within the soil increases," said Rupert.

He added: "Our research suggests that MAP seems able to survive for many years in acidic soils. In trials, we found that liming to raise soil pH to 6.5 led to a significant decrease in bacteria numbers."

This was encouraging news for the McEwens who have, over the last decade, concentrated on soil improvement, in particular lifting the pH levels.

"In the mid-1990s, we soil-sampled over the farm and discovered that the pH levels were generally low," explained Duncan McEwen junior.

"Since then we've limed every field, spreading half a tonne per acre annually for several years, and then we soil sampled again. Now most fields are at pH six or above, with some small areas still needing a bit more lime to get the pH right.



Dr Rupert Hough, The James Hutton Institute

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Rupert explained that MAP bacteria appear to favour a number of particular on-farm environments, including soils with high levels of organic matter and wet soils, created either through high rainfall or poor drainage.

To help livestock farmers understand everyday management practices which can influence the Johne's disease risk on their farms, Rupert and his colleagues have compiled a "Johne's Ready Reckoner", which outlines high, medium and low-risk methods of manure and slurry management, silage making, livestock water supply, pasture management, soil conditions and livestock husbandry.

With faecal material acknowledged as the main spreader of Johne's disease, Rupert highlighted the risk of taking dung from other farms with an unknown disease status, and advised that it should not be spread on grazing land.

Soil types vary at Arnprior Farm, with some gravel loam land south of the A811 road which dissects the farm. At an earlier meeting, Duncan McEwen senior had told the community group: "There's no such thing as too much dung for this gravelly land."

Consequently, in addition to dung from their housed cattle, the McEwens bring in extra from a neighbouring farm.

"After learning that this dung could be increasing our Johne's risk if spread on grazing land, I'm relieved we've only used it on cropping ground," remarked Duncan McEwen junior. "And we will most definitely continue to do so!"